



# Organizational Results

Annual Report  
Fiscal Year 2008

Organizational Results  
Annual Report – Fiscal Year 2008  
July 1, 2007 – June 30, 2008

*Missouri Department of Transportation  
P.O. Box 270  
Jefferson City, Missouri 65109*

Contents

|                                    |       |
|------------------------------------|-------|
| Organizational Support .....       | 3-8   |
| Innovative Solutions .....         | 9-12  |
| Research .....                     | 13-51 |
| Highlighted Research .....         | 14-17 |
| Research Reports Published .....   | 18-26 |
| Research Summaries Published ..... | 27-28 |
| Contract Research Status .....     | 29-46 |
| In-House Research Status .....     | 47-51 |
| Budget and Performance Data .....  | 51-56 |

## Results ...

It's in our name, and what we strive to deliver to department managers each and every day. Organizational Results was formed in 2005 by combining strategic planning, research and process improvement staffs into one unit. With a direct reporting structure to the department director, Organizational Results works with performance issues from the field level all the way to the executive boardroom.

Our group of professionals from business and engineering backgrounds has become a vital source for department managers to access the latest information, tools and resources to close performance gaps. Through partnerships with public and private sectors, Organizational Results delivers best practices and innovative solutions designed to deliver a world-class transportation experience.

Our annual report is designed to provide insight into this unique structure and our accomplishments during the past twelve months.

Respectfully submitted,



Mara Campbell  
Organizational Results Director



## Organizational Support

*We seek to provide MoDOT with the tools and expert consultation to drive performance excellence.*

- ◆ *Performance analysis and consultation*
- ◆ *Performance measurement development*
- ◆ *Quality systems and tools development*
- ◆ *Process team facilitation*



## MoDOT Wins the Missouri Quality Award

Never before was MoDOT's "One Team" approach put to the test as managers from across the agency attempted to reduce our business model to a 50-page application. The Missouri Quality Award application process and site visit was coordinated and supported by the entire OR staff. Hundreds of staff hours were spent refining descriptions of business approaches and poring over every chart and graph.

Modeled after the Malcolm Baldrige Award, MoDOT's application was reviewed by a team of business professionals in seven categories: leadership; strategic planning; customer and market focus; measurement, analysis and knowledge management; workforce focus; process management and results. MoDOT's initial score was high enough to pique the team's interest, and the site visit sealed the deal.

In giving the award, the Excellence in Missouri foundation cited MoDOT's visionary leadership and its use of innovative tools and programs to meet the transportation needs of its customers. Only one other state agency has ever won the award.

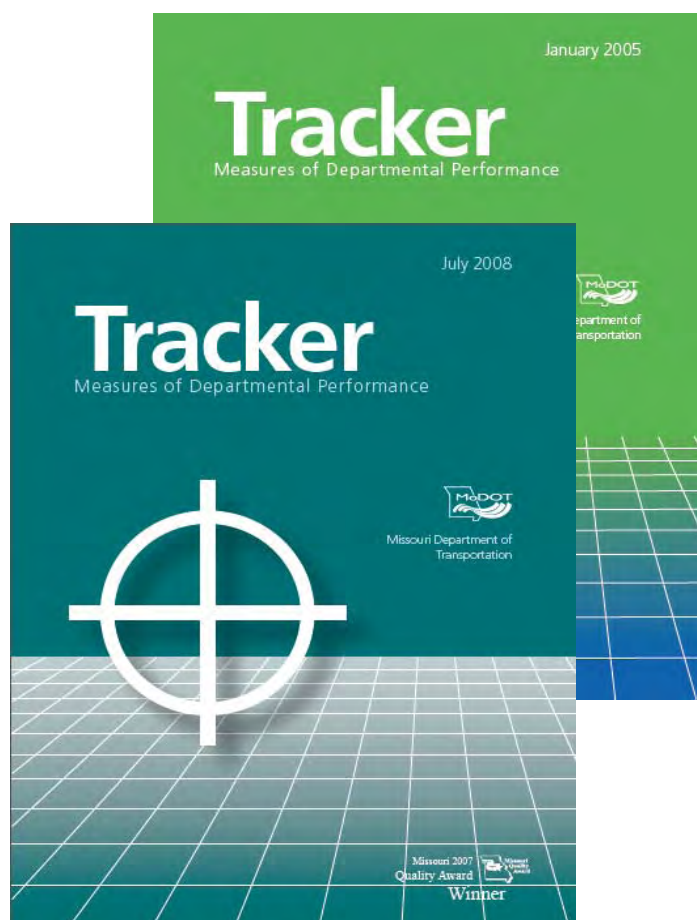


### Tracker Turns Three

Shortly after taking the helm as MoDOT's director, Pete Rahn convened his top managers to identify how MoDOT measures success. The group was challenged to list what our customers expected from MoDOT. The result was 18 tangible results. These were to be the driving force behind everything MoDOT does. But the tangible results had to be a stronger link than some posters on the conference room walls. That's why the second assignment to managers was to identify measures that would give MoDOT the best indication of how it was doing at delivering those tangible results. Some traditional performance measures found spots within the tangible results, such as Pavement Conditions, while others were discarded. Gaps in performance measures also had to be filled.

The first publication of the performance measurement system was January 2005. The Tracker has been published each quarter since and distributed internally and externally to decision makers, transportation partners and Missouri citizens. Members of the executive team were assigned as drivers of performance within each tangible result. Mid-level manager were also assigned as drivers for individual performance measures. To keep everything clicking, Organizational Results provides performance analysts as support staff to each measure, as well as coordinating the quarterly Tracker publication.

However the real challenge was getting the measures integrated into the management process. Toward that end, quarterly review meetings are conducted that typically last from six to eight hours. The measurement drivers, who are the managers responsible



for each performance measure, provide updates on what has been delivered; not what they are planning to do. The meeting focuses on accomplishments and delivery on our promises. All drivers are required to attend and participate in the meetings. This approach creates a cross-divisions and cross-boundaries educational process for all staff. It also provides personnel with a better understanding of activities throughout the agency.

In the last three years, OR staff has logged thousands of hours helping department managers refine Tracker measures to provide valuable information toward improving overall organizational performance. Staff has also assisted divisions and districts in developing their own Trackers with more detailed measures to help manage daily operations.





Process owners also diagnosed:

- how well each process addresses its intended purpose,
- to what extent the approach is aligned with the organization's needs
- to what degree each process produces the required product or service while most effectively managing time, resources, effort and cost, and
- how well each process is implemented, documented, trained and communicated.

Division and unit heads received reports with high-level flowcharts and analysis of each process identifying opportunities for process improvement including recommendations for process elimination, consolidation and/or automation. The reports have already resulted in several new process improvement teams and will serve as an important resource for new as well as experienced managers in providing the best value for every dollar spent.

### Key Process Initiative Focuses On Central Office Processes

MoDOT has been running process improvement teams since the late 1980s. Hundreds of processes have been streamlined and refined along the way. But with changes in leadership, organizational structures and technology, the time was right for a high-level process review within MoDOT's Central Office. This past year, Organizational Results staff completed the Key Process Initiative with 21 divisions and units in Jefferson City.

OR facilitators conducted meetings with supervisors and senior staff in each area to identify:

- five to seven most important processes,
- process cycle times from best to worst,
- value added time (cycle time minus wait time), and
- process bottlenecks.

### Team Facilitation Projects

*FY 2008*

- o Major Bridge Maintenance Plan
- o Median Guard Cable
- o Streamline the Change Order Process
- o Uniform Process, Checklist Forms and Time Lines Team
- o Incident Response Plan
- o Financial Forecasting/STIP Targets Team
- o Striping Quick Action Team, Phase II
- o Energy Efficiencies – Fleet and Fuel Consumption, Phase II
- o Excess Property Disposal Strategy
- o Weight Restriction for Employees Action Team

### Performance Incentive Program Saves Over \$200 million

The Performance Plus program with three active incentive programs active in fiscal year 2008 resulted in net savings to MoDOT of more than \$234 million dollars. And that's after subtracting incentive payments of as much as \$500 per quarter to around 1,600 employees.

The program, which began with a pilot in April 2006, is designed to reward MoDOT employees for going above and beyond the call of duty to increase MoDOT's productivity. Incentive programs must pay for themselves with savings generated from improved employee performance. At this time there are three employee incentives with more in the planning stages.

The Construction Cost Savings Incentive provides incentives to MoDOT employees who are permanently assigned to construction project offices statewide if they achieve a final construction cost of 1 percent above the contract award amount (or less) on projects in our Statewide Transportation Improvement Program. The savings that come from reducing project costs fund the quarterly payments. Based on our current 2 percent construction contingency, even jobs that come in at 1 percent above the contract award amount will result in cost savings.

The Injury Reduction Incentive rewards employees in highly hazardous jobs for significantly reducing or eliminating fatalities, lost-time incidents and injuries requiring medical attention beyond first aid (OSHA recordables), which in turn reduces workers' compensation claims. The savings in workers' compensation costs will pay for the incentives.



The Project Scoping and Estimating Incentive aims to save money through more accurate project cost estimating. Accurate estimating ensures our bond rating remains excellent, which translates into lower interest rates. Greater fiscal responsibility enhances our reputation and credibility and allows us to maximize the limited funding we receive. Specifically, the incentive has the potential to reward employees in work groups who accurately estimate project costs so that project award amounts are within 1 percent over or 5 percent under the construction estimate.







## Partnering Meeting Targets Motor Carriers Industry

In November 2007, MoDOT conducted its fifth Partnering for Innovative Efficiencies meeting with representatives from the motor carrier industry to identify challenges in moving freight in and through Missouri. Organizational Results staff coordinated the event and facilitated team breakout session and general discussions. Accomplishments since that meeting include:

- The Missouri State Highway Patrol and MoDOT developed a procedural policy providing direct contact from the patrol to the Traffic Management Centers in Kansas City and St. Louis for incidents that require activation of the Dynamic Message Signs on I-44 and I-70.
- In May 2008, MoDOT opened a truck-only parking area on I-44 East in Strafford. The former site of a weigh station, the facility is a wise use of existing resources and will allow 10 drivers to park and rest.



- KC Scout received FCC licensing to change frequencies for the Highway Area Radio (HAR). The new frequency will provide better coverage and eliminate interference problems with the nearby airport transmitter.
- MoDOT and HNTB visited with several motor carrier stakeholders to educate them about the Supplemental Environmental Impact Study proposals and obtained feedback on increased truck lane proposals, tolling and other funding options.

Another partnering meeting was held in May 2008 regarding external communication. The results from that meeting are being incorporated into department's communication plans.





## **Innovative Solutions**

*Putting our research to work and taking advantage of best practices are critical to our success.*

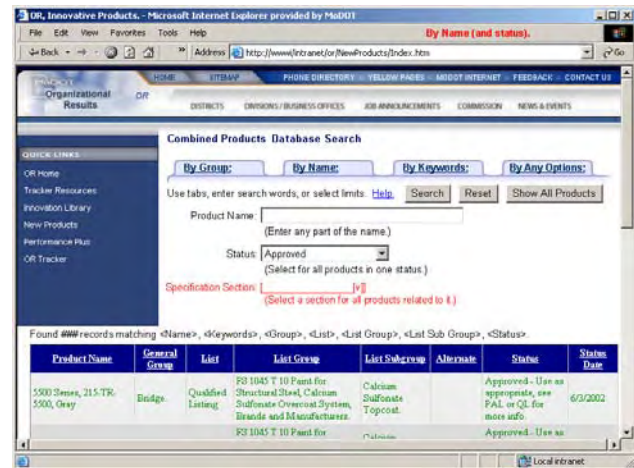
- ◆ *Research implementation*
- ◆ *Coordination of applied technologies*
- ◆ *New products evaluation*
- ◆ *Best practice sharing*
- ◆ *Literature searches*

## New Process Streamlines Product Evaluations

MoDOT is serious about getting the best value for every dollar spent, but that doesn't always mean the cheapest. Quality and performance are also part of the equation. But how do hundreds of MoDOT employees make decisions about thousands of products each claiming to be better than its competitors?

Until recently, field employees often relied on comparative data supplied by a high-pressure salesman. Sometimes this resulted in products being purchased that were too expensive or even worse products that performed poorly. There was little communication on what products were being used throughout the state, so good products could be overlooked and poor product reordered. The existing new products evaluation process was shared among three divisions at the Central Office. With no clear contact point, employees often bypassed the process entirely.

That's when Organizational Results staff stepped forward to offer a single contact point and an online new products database. The new products coordinator receives and processes all new product evaluation requests. MoDOT employees can fill out a brief product evaluation request form or simply provide the product salesman a contact information card for the new products coordinator. Once the coordinator receives the evaluation form, it is checked for completeness and whether the product already meets a current specification. Information may also be gathered from other DOTs using the product. The coordinator may also work with the vendor to provide a free demonstration of the product on the state system.



The results of the product evaluations are then entered into the New Products Database. MoDOT employees can access the results online and even offer their own comments about the product's performance. The database shares both successes and failures to build upon individual experiences. Currently, the database contains more than 2,100 products.

The central contact point and simplified evaluation form have made the new product evaluation process more inviting and accessible. And the online database is providing a critical resource for decision-making. All of this has been a catalyst for new discussions about the products used on the state system and elevating the importance of new products in delivering a world-class transportation experience.







### Best Practices System Continues to Grow

During its second year at MoDOT, the Solutions at Work best practice system saw steady growth in both the number of submissions and the number of approved best practices. During fiscal year 2008, the number of submissions grew to 118, which is 16 more than a year ago. The number of approved best practices also increased by two to 19 for the year.

The Solutions at Work process begins with employees or work groups filling out a short six-question online form. Employees can access forms through the department's internal web page with the option of filling out the form online, downloading an electronic copy or printing a hard copy of the form. The online and electronic forms allow for the submission to include computer files, photos and even videos. Employees also have the option of asking for an Idea Advocate. The Idea Advocate handles ideas that employees aren't able to pilot at the local level.

Submissions begin the evaluation process by returning to employees home district or division to gain management support and verification that the practice is actually working. Once the submission has the first level of management support, it goes to a team of technical reviewers in our central office to ensure it has statewide application. The third level of review is an independent evaluation by a member of MoDOT's Employee Advisory Council to ensure overall fairness of the evaluation process. The final reviewer is the employee's district engineer or division manager. He or she has the final say on how the practice is rated and the amount of reward given to the employee.

Approved best practices are posted in our online Solutions Database with implementation details. Managers can download photos, spreadsheets and even watch videos. Best practice tip sheets are routed directly to department managers and regional implementation contacts.

This past year we began conducting a monthly videoconference with all of our regional implementation contacts. Discussions are held on submission in varying stages of the evaluation and implementation process. This regular dialogue promotes organizational buy-in and has improved our implementation rate from 56 percent to over 83 percent.



## Tool and Equipment Innovations Showcased

MoDOT has a rich history of making the most out of limited resources. Rainy days and downtime has routinely been used for creating new tools or modifying equipment to get the job done better, faster and cheaper. However, identifying the best of those innovations and sharing them statewide has been a problem.

When the Solutions at Work program began in 2006, a number of submissions were for tool and equipment innovations. But the Solutions at Work evaluation process was not geared for comparing all the designs in use throughout the state.

From problems springs opportunity. The Tool and Equipment Challenge began in 2007 as an offshoot of the Solutions at Work program. Each spring, Central Office technical experts establish three emphasis areas for tool and equipment innovations. Districts conduct local competitions during the fall with district winners being displayed at the Tool and Equipment Showcase held the following spring. An evaluation team of technical experts evaluates each innovation at the showcase in the following categories:

- o **Cost vs. Benefit** - cost effective, realistic, may reduce injuries, save time, save manpower, safe
- o **Convenience/Ease of Use** - number of employees to operate, makes the job easier, little training required, easily maintained, safe
- o **Versatility/Adaptability** - easily attached, detached and stored, multifunctional, safe
- o **Implementation** - Availability of materials, easily replicated, proven results, safe



One representative from each district also evaluates exhibitors at the showcase. The statewide evaluation team combines all the evaluations to determine a winner and two honorable mentions in each category. Individuals can take home as much as \$500 and earn their home district an additional \$10,000 for its maintenance budget.

The benefits of assembling thirty exhibits of MoDOT innovation reach farther than just the competition. Huddled groups of employees kick tires and discuss new work challenges and how innovations might make work life better.





A photograph of a person wearing a blue beanie, a yellow and black jacket, and blue pants, kneeling in a snowy field. They are holding a small object in their hands. In the foreground, the front of a white vehicle is visible, partially covered in snow. The background shows a line of trees with some autumn-colored foliage under a bright sky.

## Research

*Our business and engineering research program is targeted to have the greatest impact on delivering a world-class transportation experience.*

*Administration of research contracts with public and private organizations*

*Coordination of multi-state research projects*

*Management of in-house research activities*

## Highlighted Research

RI05-053

### Missouri Freight and Passenger Rail Capacity Analysis

The primary objective of this study was to develop a prioritized list of rail enhancements that addresses current passenger and freight rail performance on the Union Pacific line between St. Louis and Kansas City in order to improve on-time passenger service and reduce freight delays. The MoDOT Tracker performance measure related to this project is the “Number of Rail Passengers” within the performance objective of “Easily Accessible Modal Choices.” In this study the key analysis issue is the delay encountered by both Amtrak for passenger and Union Pacific for freight operations. This issue directly impacts the MoDOT Tracker performance measure “Number of Rail Passengers” since it has been found that passenger train delays are directly correlated with the number of passengers utilizing rail service.

The Theory of Constraints analysis identified the core problem as the high level (*and increasing*) of trainloads, from both quantity and weight perspectives. From a train quantity perspective this corridor is handling between 50-60 trains per day, which is at the upper limits of capacity for a double track line handling the types of freight that it does. From a train weight perspective this corridor handles a large percentage (*roughly 50 percent*) of heavy coal trains.

**Principal Investigator(s):**

Missouri Transportation Institute

**Total Amount Expended:**

\$109,127



**State and Regional Value:** Based on the analysis conducted, this study was able to pinpoint a list of proposed improvements that would improve passenger and freight movements within the corridor. The list was also prioritized to show the value provided by each transportation investment. This study has proven to be an effective communication tool for transportation officials to use with state legislators in securing additional funding for development of this vital corridor. It has also become a planning tool for efficient movements of both passenger and freight within Missouri and throughout the central section of the United States. The study also has opened further discussions with Union Pacific regarding maintenance processes that could provide reductions in overall passenger train delays without significant investment through better coordination and timing of rail repairs and maintenance.

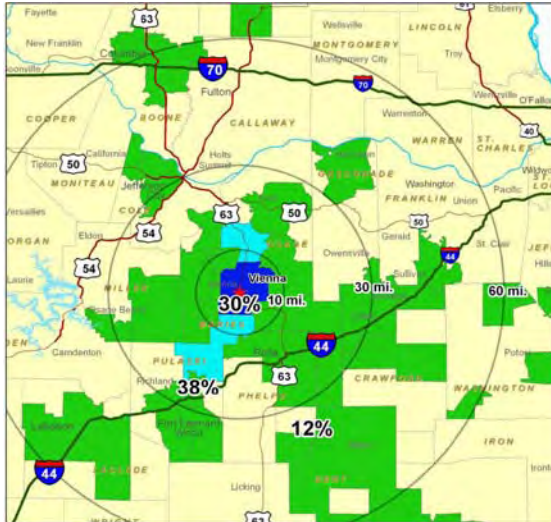
**Find the full report at:**

<http://www.modot.mo.gov/services/OR/byDate.htm>

## Highlighted Research

RI05-057B/TR08557B

### Pre-Construction Community and Business Impact Study: Highway 63 Route Relocation



MoDOT coordinated this study with the Missouri Department of Economic Development to quantify the local impact of proposed improvements to US Highway 63 through the central section of the state. A license plate study of patrons visiting local businesses in Freeburg, Vienna, Vichy and Westphalia revealed a high concentration of local customers. Analysis revealed that every business studied in each community had over 50 percent of its customer base located within 30 miles. Data further concluded that all of these communities have a very low day time population and Local Employment Dynamics (LED) data indicated most are commuters to Jefferson City, Rolla, Belle or Freeburg. The town of Vienna had the largest volume of customers from outside their community and this could certainly be a factor of their location half way between Jefferson City and Rolla and a wider selection of fuel stations and retail establishments.

Related studies identified contributing factors to economic growth that also could benefit in each of these communities. An improved highway would lead to improved traffic flow and more efficient commuting, thus possibly increasing the base residential population and enhancing the local economic dynamics. New businesses could also be interested in the area due to improved travel times and conditions for their transportation vehicles.

**State and Regional Value:** Regional planners used the study findings at public meetings in communities surrounding the proposed improvement projects. Residents were able to not only see proposed highway alignments, but also the positive economic impact to their communities. Population, taxable sales and household income were increasing at a steady rate within the study area. However, taxable sales were low compared with surrounding counties, most of which have four-lane road systems.

#### Find the full report at:

<http://www.modot.mo.gov/services/OR/byDate.htm>

#### Principal Investigator(s):

Missouri Economic Research and Information Center, Central District and Organizational Results

#### Total Amount Expended:

\$18,000



## Highlighted Research

RI06-020/TR080620

### Investigations of Failures of Epoxy Polymer Overlays in Missouri

Epoxy Polymer Overlays have been used to seal bridge decks in the United States for over 40 years. Missouri placed the first epoxy polymer overlay (EPO) in June of 1989 on the Poplar Street Bridge over the Mississippi River in St. Louis. MoDOT now has well over 300 bridge decks treated with an epoxy polymer overlay.

Missouri has had some epoxy polymer overlays that have exceeded their life expectancy of 10-15 years while other overlays have shown signs of failure within 2 years after placement. The purpose of this research study was to try and determine why some epoxy polymer overlays (EPO) have provided successful protection for over a decade and why some overlays have begun to fail after only a few years. While an EPO provides protection from chloride penetration and water infiltration when it works correctly, it is more expensive than traditional deck sealers that are meant to last 3-5 years. When the EPO fails short of its lifespan it is not cost effective and can also be difficult to remove.

MoDOT randomly selected 10 EPO bridges from each of the 10 districts to create a database of information. The study attempted to find correlations between the performance of the EPO with previous deck rating, product type, span length, girder type, number of freeze/thaw cycles, temperature at placement, and ADT.

#### Principal Investigator(s):

Missouri Department of Transportation

#### Total Amount Expended:

In-house



**State and Regional Value:** An unexpected observation during the study was the presence of pitting on a majority of the bridge decks. One source of pitting is the presence of air bubbles in the epoxy component of the overlay. In discussions with epoxy suppliers it was noted that the use of certain types of paddles for mixing can lead to air bubbles within the epoxy. The proper type of paddle to be used is called a “jiffy paddle” or a “Sika paddle.”

Epoxy Polymer overlays can provide a long lasting protection for bridge decks, but only if the bridge deck is still in decent shape. Once the deck deteriorates and requires patching on more than 5 percent of the deck, the overlay will most likely perform well for only a few years.

MoDOT has had many successes with epoxy polymer overlays but also many failures. Many of the failures can be attributed to decks that were beyond the deterioration level of a good EPO candidate.

#### Find the full report at:

<http://www.modot.mo.gov/services/OR/byDate.htm>

## Highlighted Research

RI07-030/TR080730

### Assessing MoDOT's Efforts to Provide the Right Transportation Solution



The Missouri Department of Transportation (MoDOT) has developed the Tracker system to assess performance with tangible results to help MoDOT “provide a world-class transportation system that delights our customers.” The Tracker system includes the concept of “Fast projects that are of great value,” and an important aspect of this measure is whether Missourians view MoDOT projects as the right transportation solution. To assess customer satisfaction with MoDOT projects, Heartland Market Research LLC conducted a mail survey in fall 2007. A total of 2,361 Missourians returned a valid survey questionnaire for a margin of error of approximately plus or minus 2.06 percent.

The basic research design for the project was to sample opinions on a variety of projects spread across the state as was done in the previous fiscal year. When available, a small, medium, and large project from each of the 10 MoDOT districts was selected by a regional manager for the project for a total sample of 29 projects.

**State and Regional Value:** The results show that most Missourians are very satisfied with both the local project and with MoDOT’s overall efforts. Based upon their responses, we know that these opinions are mostly based upon exposure to the local projects. Nearly 94 percent of the respondents were either “very” or “fairly” familiar with the project roadway. More than 73 percent of the respondents were regular users of the affected roadway (defined as using it at least once per week). The majority of respondents thought that the project made the roadway safer (94.6 percent), more convenient (90.8 percent), less congested (81.1 percent), easier to drive (92.9 percent), better marked (89.9 percent), and was the right transportation solution (93.9 percent). On a more general measure, 84 percent of the respondents stated that they were satisfied with MoDOT’s efforts to provide a quality transportation system in Missouri.

#### Find the full report at:

<http://www.modot.mo.gov/services/OR/byDate.htm>

#### Principal Investigator(s):

Heartland Market Research, LLC

#### Total Amount Expended:

\$36,000



## Research Reports Published

Full reports can be found at:

<http://www.modot.mo.gov/services/OR/byDate.htm>

RI07-038A/TR080738A

**Effectiveness of HDPE Pipe**

**Currently Installed in Missouri (Phase 1)**

**Principal Investigator:**

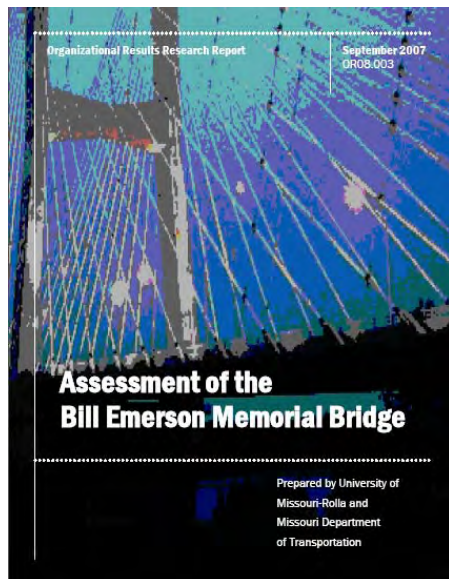
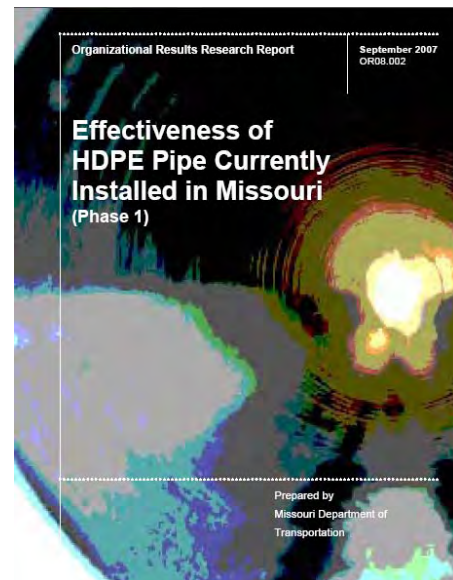
Missouri Department of Transportation

**Total Amount Expended:**

In-house

**Project Purpose:**

This study concentrated on the condition of HDPE pipe currently installed on Missouri's state system. A future report will more fully address the specification.



RI05-023

**Assessment of the Bill Emerson Memorial Bridge**

**Principal Investigator:**

University Transportation Center at the University of Missouri-Rolla

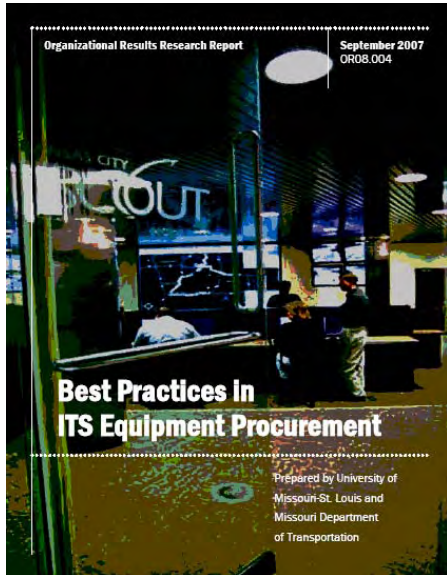
**Total Amount Expended:**

\$49,003

**Project Purpose:**

In this study, both ambient and earthquake data measured from the Bill Emerson Memorial Cable-stayed Bridge are reported and analyzed. Based on the seismic instrumentation data, the vibration characteristics of the bridge were used to validate a three-dimensional Finite Element (3-D FE) model of the bridge structure. Since the model was developed from as-built drawings, the model can be used as a benchmark for safety evaluations and health monitoring of the bridge.

## Research Reports Published (cont'd.)



RI06-044/TR080644

### Best Practices in Intelligent Transportation Systems Equipment Procurement

**Principal Investigator:**

Center for Transportation Studies, University of Missouri – St. Louis

**Total Amount Expended:**

\$12,261

**Project Purpose:**

This study provided MoDOT an evaluation of best practices for procuring ITS equipment within the confines of current law and department policies as well as providing the most economical and compatible solutions with existing equipment, software and systems.

RI07-006/TR080706

### Investigating Large Truck-Passenger Vehicle Interactions

**Principal Investigator:**

Department of Civil and Environmental Engineering, University of Missouri - Columbia

**Total Amount Expended:**

\$21,904

**Project Purpose:**

This study analyzed truck-passenger car interactions for Missouri urban and rural freeways. On urban freeways, the percentage of truck crashes is disproportionately larger when considering the volume or exposure of trucks. In contrast, the rural data in general shows that truck crashes are not as disproportional to the crash rates of passenger vehicles.



## Research Reports Published (cont'd.)

RI06-045/TR080645

### Best Practices for Implementing a Biodiesel Program

**Principal Investigator:**

Engineering Management and Systems Engineering  
University of Missouri - Rolla

**Total Amount Expended:**

\$14,501

**Project Purpose:**

This study identified best practices for implementing a biodiesel program. Year round operability, pricing and availability, and fuel efficiency were the specific variables that were studied. The study was accomplished by contacting other state DOTs seeking information on their biodiesel programs, practices, and lessons learned. A list of best practices was then compiled, with added inputs from literature review. An electronic survey was sent out to the contacts to prioritize these best practices.



RI07-027/TR080727

### Update of Missouri Port Authority Assessment

**Principal Investigator:**

Missouri Department of Transportation

**Total Amount Expended:**

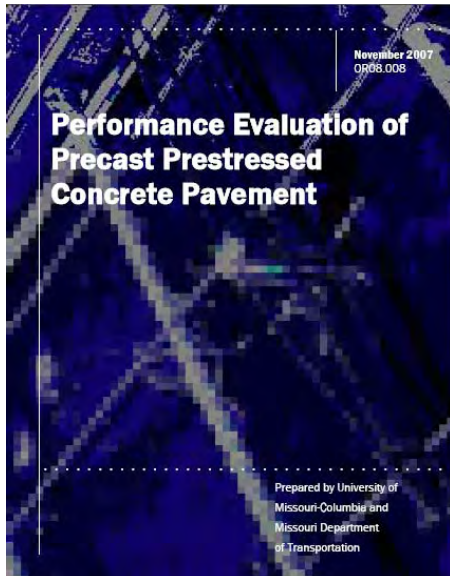
In-house

**Project Purpose:**

This study updated data from the “Missouri Public Port Authorities Assessment of Importance and Needs” and provides an overview of port development needs.



## Research Reports Published (cont'd.)



RI03-007

### Performance Evaluation of Precast Prestressed Concrete Pavement

**Principal Investigator:**

University of Missouri - Columbia

**Total Amount Expended:**

\$330,203

**Project Purpose:**

The primary objective of this research was to evaluate the performance of the PPCP and develop performance data useful for future projects. The primary difference in this FHWA-MoDOT project compared to other recently completed FHWA projects in Texas and California was the incorporation of instrumented pavement panels to quantify pavement performance.

RI07-009/TR080709

### Qualitative Assessment of Customer Satisfaction in the Kansas City Area

**Principal Investigator:**

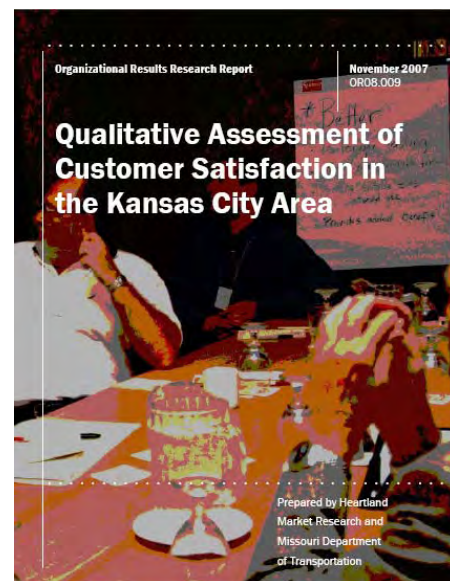
Heartland Market Research LLC

**Total Amount Expended:**

\$111,126 (includes funding for RI07009a)

**Project Purpose:**

The qualitative results obtained from five focus groups from the Kansas City area will aid in the development of a quantitative research study that will provide statistical evidence supporting or eliminating reasons for the satisfaction discrepancy between Kansas City Area residents and other Missouri residents.



## Research Reports Published in (cont'd.)

RI00-027

### Evaluation of Stainless Steel Reinforcement in Bridge Decks

**Principal Investigator:**

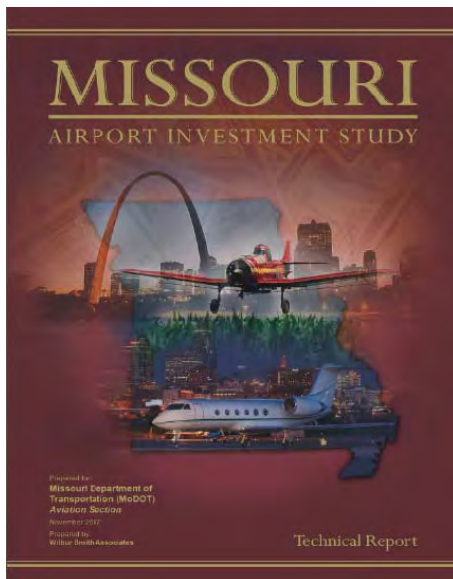
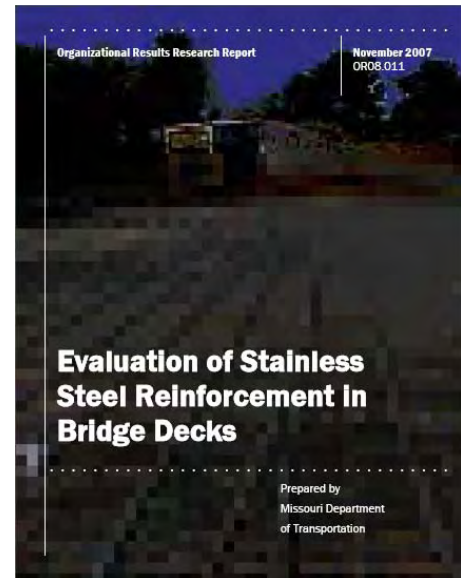
Missouri Department of Transportation

**Total Amount Expended:**

In-house

**Project Purpose:**

This report is a follow up and final report to the report on the “Evaluation of Stainless Steel Reinforcement, Construction Report. RDT 03 – 003.” The results of interim testing during the bridge’s first five years are reported for Missouri’s first cast-in-place bridge deck using solid stainless steel reinforcing bars.



RI03-056 /TR080356

### Missouri Airport Investment Study

**Principal Investigator:**

Wilbur Smith Associates

**Total Amount Expended:**

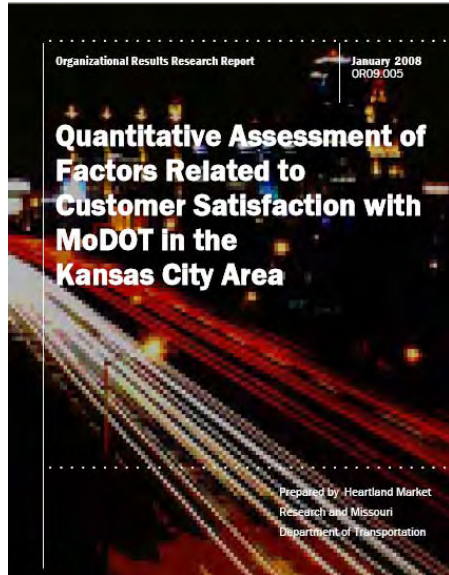
\$128,299

**Project Purpose:**

This study determined the potential effects of airport investment in Missouri in terms of economic development and found positive benefits from investments in Missouri’s general aviation airports.



**Research Reports Published (cont'd.)**



RI07-009A/TR080709

**Quantitative Assessment of Factors Related to Customer Satisfaction with MoDOT in the Kansas City Area**

**Principal Investigator:**

Heartland Market Research LLC

**Total Amount Expended:**

\$111,126 (includes funding for RI07-009)

**Project Purpose:**

A mailed survey was sent to approximately twenty thousand citizens from District Four (Kansas City Area) residents in order to gather statistical evidence for supporting or eliminating reasons for the satisfaction discrepancy between Kansas City Area residents and other Missouri residents. Building upon the October 2007 qualitative study, this quantitative study clearly identified three factors that explained 30.4 percent of the variance in how satisfied District Four residents were with MoDOT.

RI06-036/TR080636

**Freight Optimization and Development in Missouri: Ports and Waterways Module**

**Principal Investigator:**

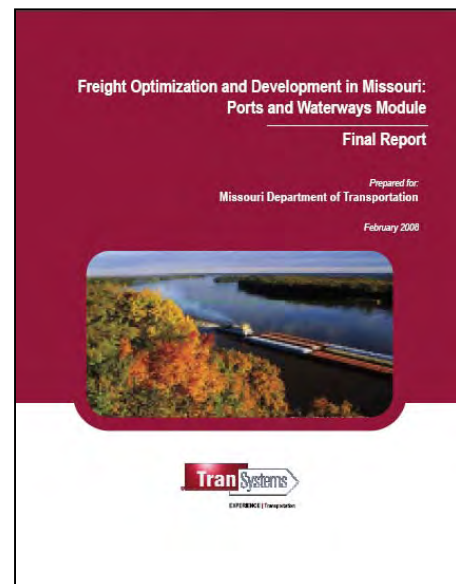
TranSystems Corporation

**Total Amount Expended:**

\$125,000

**Project Purpose:**

The objectives of this study were to provide an inventory of Missouri's public and private port operations and public port needs; and create a Waterways Prioritization Process that will assist MoDOT in making justifiable investment decisions that meet the needs of not only Missouri's ports, but the state itself.



## Research Reports Published (cont'd.)

RI07-038B/TR080738 and RI07-058/TR080758  
Effectiveness of Metal and Concrete Pipe  
Currently Installed in Missouri (Phase II)

**Principal Investigator:**

Missouri Department of Transportation

**Total Amount Expended:**

In-house

**Project Purpose:**

This study concentrated on the condition of corrugated metal (corrugated galvanized steel, aluminized steel, aluminized-bituminous coated steel, aluminum alloy, epoxy coated steel pipe) and reinforced concrete pipe currently installed on Missouri DOT's system and of the specifications as written.



RI06-001 /TR080601

Resilient Moduli of Typical Missouri Soils and  
Unbound Granular Base Materials

**Principal Investigator:**

Missouri University of Science and Technology

**Total Amount Expended:**

\$102,373

**Project Purpose:**

This study accurately determined the resilient moduli for common Missouri subgrade soils and unbound granular base materials in accordance with the AASHTO T 307 test method. The results of this project allowed MoDOT pavement engineers to calibrate the M-E design guide according to Missouri's conditions and materials.

## Research Reports Published (cont'd.)



RI05-052/TR080552

### Determination of Creep Compliance and Tensile Strength of Hot Mix Asphalt for Wearing Courses in Missouri

**Principal Investigator:**

Missouri University of Science and Technology

**Total Amount Expended:**

\$57,569

**Project Purpose:**

The study determined the creep compliance, Poisson's ratio, tensile strength, and tensile failure strain of several HMA surface mixes in general accordance with AASHTO T 322-07. The test results included creep compliance. The research examined six different plant-produced mixes.

RI08-020/TA08115

### Assessment of Driver Recognition of Flashing Yellow Left-Turn Arrows in Missouri

**Principal Investigator:**

Missouri Department of Transportation

**Total Amount Expended:**

In-house

**Project Purpose:**

This study determined driver understanding of the flashing yellow left-turn indication. Based on the limited recognition of yellow left-turn arrows, it is recommended to proceed with caution in the installation of these indications at more locations around the state.



## Research Reports Published (cont'd.)

RI06-007/TR080607

### Evaluation of Experimental Traffic Sign: Signal Photo-Enforced

**Principal Investigator:**

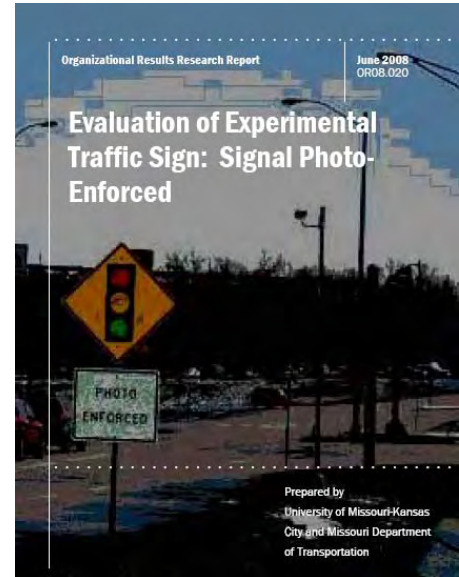
University of Missouri – Kansas City

**Total Amount Expended:**

\$24,570

**Project Purpose:**

This study evaluated the current traffic signs and a new experimental regulatory traffic sign that both indicate an upcoming traffic signal is being photo enforced.



RI05-024B

### Inspection of Deterioration of Precast Prestressed Panels on Bridges in Missouri

**Principal Investigator:**

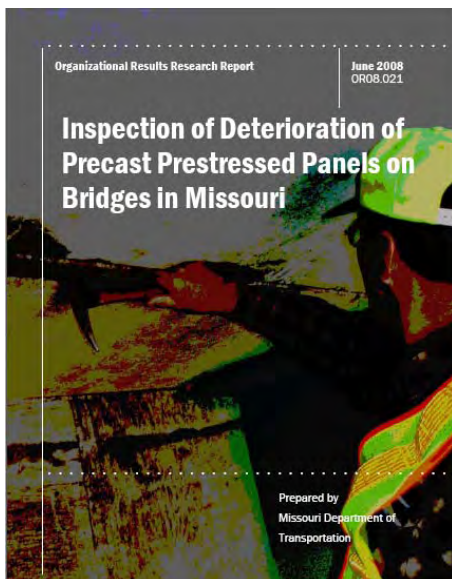
Missouri Department of Transportation

**Total Amount Expended:**

In-house

**Project Purpose:**

This study used field inspections to determine possible causes for spalling occurring four bridges on the state highway system using precast prestressed panels. Recommendations for maintenance and prevention were also formulated.

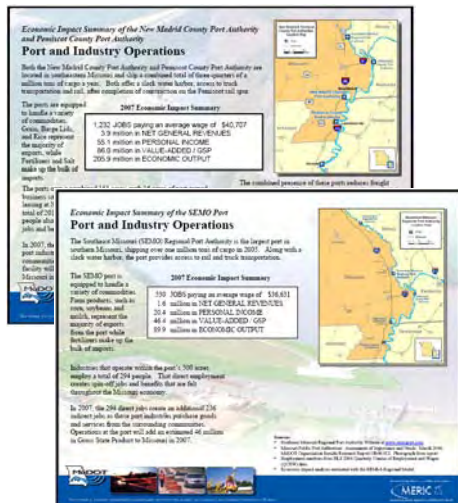




## Research Summaries Published

Full research summaries can be found at:

<http://www.modot.mo.gov/services/OR/byDate.htm>



RI05-057

### Economic Impact Summaries: SEMO, New Madrid and Pemiscot Port Authorities

**Principal Investigator:**

Missouri Economic Research and Information Center

**Total Amount Expended:**

\$17,500

**Project Purpose:**

This study used the MERIC economic model to quantify the economic impact of three Missouri port authorities.

RI005-037

### Evaluation of Automatic Flagger Devices

**Principal Investigator:**

Missouri Department of Transportation

**Total Amount Expended:**

In-house

**Project Purpose:**

This study used public questionnaires, comments from flaggers and field observations to evaluate three automatic flagger devices for effectiveness and cost.



## Research Summaries Published (cont'd.)

RI07-040 /TR080740

### Qualitative Assessment of the MoDOT Web Site

#### Principal Investigator:

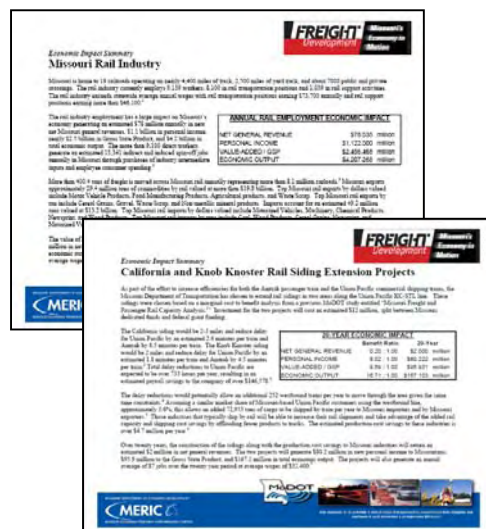
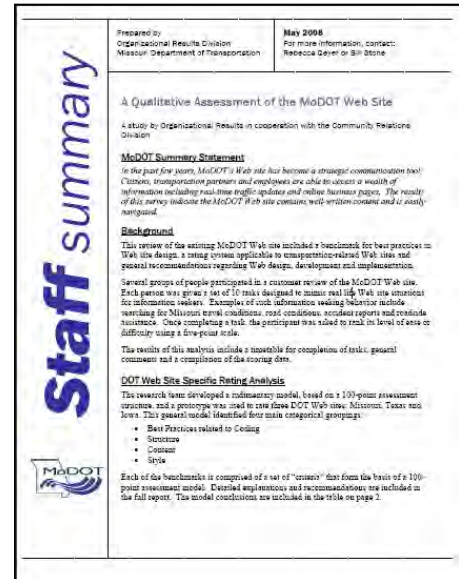
Design 2 Perfection

#### Total Amount Expended:

\$26,750

#### Project Purpose:

In the past few years, MoDOT's Web site has become a strategic communication tool. Citizens, transportation partners and employees are able to access a wealth of information including real-time traffic updates and online business pages. The results of this survey indicated the MoDOT Web site contains well-written content and is easily navigated.



RI08-022 /TR080822

### The Economic Value of Investment in Freight Transportation: Missouri Rail

#### Principal Investigator:

Missouri Economic Research and Information Center

#### Total Amount Expended:

\$9,000

#### Project Purpose:

This study used the MERIC economic model to quantify the economic value of investments into Missouri's rail system including a specific improvement for rail sidings.

## Contract Research Status

RI98-034

Wind Induced Vibration of Stay Cables, Pooled Fund SPR-3 (078)

**Principal Investigator:** Hal Bosch FHWA-Turner Fairbank

**Total Contract Amount:** \$804,000

**Contract Begin Date:** 9/1/1999

**Contract End Date:** 12/31/2004

**Contract Extension Date:** FHWA Lead

**Project Purpose:** The purpose is to develop guidelines for wind-resistant design of new cable systems and procedures for implementation of countermeasures to stabilize in-service cables.

**Task Milestones and Accomplishments:** The main task left at this point is to publish design guidelines for owners and practitioners. A first draft was completed in the winter of 2007 and reviewed by an expert panel. The second revision of the guidelines document has been completed and submitted to the panel for review. The project will also be instrumental to the Bill Emerson Bridge in Cape Girardeau, Missouri. The monitoring equipment is purchased and the system is ready to go; however there have been problems with the server on site. This has led the PI to investigate other alternatives.

---

RI01-055

Construction of Crack Free Concrete Bridge Decks, Pooled Fund TPF-5 (051)

**Principal Investigator:** University of Kansas

**Total Contract Amount:** \$225,000 IBRC funds for LC-HPC deck.

**Contract Begin Date:** 4/30/2003

**Contract End Date:** 7/31/2008

**Project Purpose:** Define new mix types, mixing, placing and curing practices to reduce (eliminate) shrinkage cracking in concrete bridge decks. This will be done by optimum gradation, less cement, and best practices in placing and curing the concrete.

**Task Milestones and Accomplishments:** The five-year pooled fund expired in March 2008 and a new Phase II pooled fund began. Missouri is not participating in phase II, however, OR will continue the research project in house. KU will still help pour and inspect Missouri's deck on one of a set of twin bridges on project J4P1707, Rt. 71, Cass Co. This Low Cracking High Performance Concrete will be placed on pre-cast deck panels and compared to the twin placed conventionally. The project in Cass Co. has been awarded and has a completion date of January 31, 2010. OR will monitor construction and prepare a report after the bridge deck is placed.

**Contract Research Status (cont'd.)**

RI02-022/TR080222

**Flexural Upgrade of Deficient Bridges with Composites****Principal Investigator:** Missouri University of Science and Technology**Total Contract Amount:** \$1,179,458**Contract Begin Date:** 4/30/2003**Contract End Date:** 7/31/2008

**Project Purpose:** Five bridges were reinforced with FRP to assess potential improvements in load carrying capacity. The long term monitoring and load testing of these systems will last five years. Complete specifications and procedures were written for FRP strengthening of concrete bridge superstructures.

**Task Milestones and Accomplishments:** Previous reports on laboratory testing of FRP and full design and guide specifications for FRP strengthening were provided. The final report is being reviewed and will be posted after this fall. The final report will include all aspects of five years of load testing on the FRP reinforced bridges.

---

RI04-002/TR080402

**AASHTO M-E Pavement Design Guide Implementation for Missouri****Principal Investigator:** Applied Research Associates**Total Contract Amount:** \$449,141**Contract Begin Date:** 3/12/2004**Contract End Date:** 5/31/2007**Contract Extension Date:** 8/31/2008

**Project Purpose:** The purpose is to provide services to assist MoDOT in the local calibration and validation of the Mechanistic Empirical Pavement Design guide (M-E PDG) developed under NCHRP Project 1-37A.

**Task Milestones and Accomplishments:** Applied Research Associates (ARA) during the quarter reconciled all the information received from MoDOT and are finalizing the calibration runs. ARA expects the calibration exercise and sensitivity analysis tasks to be completed by June 15th. ARA requested and was granted a no-cost extension by MoDOT on June 17, 2008. The no-cost extension extends the project deadline to August 31, 2008.



**Contract Research Status (cont'd.)**

RI06-038/TR080638

Development of Hand-Held Thermographic Inspection Technologies, Pooled Fund  
TPF-5(152)

**Principal Investigator:** University of Missouri - Columbia

**Total Contract Amount:** \$241,533

**Contract Begin Date:** 1/29/2007

**Contract End Date:** 2/28/2009

**Project Purpose:** The purpose is to provide maintenance and inspection personnel with an effective tool for detecting and monitoring concrete deterioration without disrupting traffic flow and to develop a guideline and written practice that enables maintenance and inspection personnel to use IR cameras as part of normal operations.

**Task Milestones and Accomplishments:** Each state has received their hand-held Thermographic camera and has begun collecting field data. The data collected will be sent to the PI to determine the cameras effectiveness. The states will also provide feedback on ease of use. The lab portion of the project began collecting data for shady areas of bridge decks.

---

RI06-043/TR080643

Benefit-Cost Evaluation of MoDOT's Total Striping and Delineation System

**Principal Investigator:** Midwest Research Institute

**Total Contract Amount:** \$50,000

**Contract Begin Date:** 3/26/2007

**Contract End Date:** 6/1/2008

**Contract Extension Date:** 9/30/2008

**Project Purpose:** Evaluate the effectiveness of the total striping and delineation system incorporated in the SRI. The economic impact and public perception of improved delineation is also included in the evaluation.

**Task Milestones and Accomplishments:** MRI has generated preliminary results of our before-after evaluation of the safety effectiveness of SRI project packages. The results include all of the crash data from 2007, which was obtained around June 1, 2008. The preliminary results were presented to MoDOT and discussed. MRI is also in the process of obtaining cost data from MoDOT so that we can conduct a benefit-cost analysis. MRI is also preparing a draft final report that will present the results of the research, including the survey results, the safety evaluation, and the benefit-cost analysis. *In late May 2008 the crash data became available and a no-cost extension moved the date for completion to September 30, 2008.*

**Contract Research Status (cont'd.)**

RI07-002/TR080702

**Remote Health Monitoring for Asset Management****Principal Investigator:** University of Missouri - Columbia**Total Contract Amount:** \$14,920**Contract Begin Date:** 3/1/2007**Contract End Date:** 2/28/2008**Contract Extension Date:** 11/29/2008

**Project Purpose:** Develop remote health monitoring technology that will develop an instrumented pile to provide real-time data on bridge scour and seismic activity, allowing for the remote monitoring of bridge conditions by key managers and engineers. MoDOT is in a shared fund project with Tennessee DOT.

**Task Milestones and Accomplishments:** MU is developing an instrumented pile to test the technology. The data acquisition system has been developed and the pile/sensor design is finalized. The PI is awaiting Department of Natural Resource permits to deploy pile in a stream.

---

RI07-005/TR080705

**Amphibian Conservation in Mitigation Wetlands****Principal Investigator:** Missouri Transportation Institute**Total Contract Amount:** \$32,250**Contract Begin Date:** 3/1/2007**Contract End Date:** 11/15/2007

**Project Purpose:** The ultimate objective of this research is to provide MoDOT with the ability to assess the affect of wetland impacts on amphibian communities, score proposed mitigation sites as potential amphibian habitat, and design wetlands to target the needs of uncommon amphibian species.

**Task Milestones and Accomplishments:** The wetland areas have been designed and built for experimentation that will last until 2010. Over 14,000 individual metamorphs representing five species, and possible hybrid leopard frogs, were captured leaving the experimental wetlands where they developed. The only wetland design that resulted in production of metamorphs from all species detected was the shallow/vegetated/no fish design - the design that we hypothesized would be the "best". Ninety five percent of all metamorph production occurred within shallow-sloped wetlands. However, production was exclusive to the wetlands containing cordgrass plugs. American toad young were produced at all wetland designs except the steep slope/no fish design. However, overall production for this species was also highest in fish-free wetlands.

These results indicate, at least for the first year after construction, overall amphibian metamorph production and species richness is greatest in wetland designs that incorporate shallow within-water slope, vegetation added to the littoral zone at time of construction, and un-stocked with mosquitofish. Our preliminary results from experimental replicated wetlands bolster the conclusions from the Ohio observational study at existing wetlands.

**Contract Research Status (cont'd.)**

RI07-007/TR080707

**MoDOT Customer Satisfaction Tracking-Statewide Telephone Survey**

**Principal Investigator:** Abacus Associates

**Total Contract Amount:** \$53,678

**Contract Begin Date:** 7/12/2007

**Contract End Date:** 6/6/2008

**Contract Extension Date:** 7/31/2008

**Project Purpose:** This study assesses MoDOT's statewide customer satisfaction through a telephone survey. The survey is conducted each year in May. The results are reported in the July MoDOT Tracker.

**Task Milestones and Accomplishments:** The survey was finalized on April 25 and calls were made to the customers from May 12 to May 30, 2008. Initial result data on Tracker-related questions was provided to Measurement Drivers by June 12, 2008 to allow for review and statistical drill-down of data (if needed) to be completed by the July Tracker production deadline. *This contract is complete as of 4th quarter FY 2008.*

---

RI07-009/TR080709

**Analysis of MoDOT Communication and Outreach Effectiveness**

**Principal Investigator:** Heartland Market Research LLC

**Total Contract Amount:** \$111,126

**Contract Begin Date:** 6/29/2007

**Contract End Date:** 9/7/2007

**Contract Extension Date:** 6/13/2008

**Project Purpose:** This project assessed both internal and external communication by MoDOT staff to determine if information received in the interviews with staff was the same as what the public felt about effectiveness.

**Task Milestones and Accomplishments:** The June 2008 results report that concluded this contract was received and approved on June 13, 2008 and the results were reported to the Community Relations Director. *This contract is complete as of 4th quarter FY 2008.*

**Contract Research Status (cont'd.)**

RI07-018/TR080718

**Development of a Roadside Vegetation Management System****Principal Investigator:** University of Missouri - Columbia**Total Contract Amount:** \$56,914**Contract Begin Date:** 10/15/2007**Contract End Date:** 10/31/2008

**Project Purpose:** This project combines the knowledge of the biology and weed management, with remote sensing technology and satellite imagery to evaluate the effectiveness of remote monitoring of invasive plants populations such as teasel.

**Task Milestones and Accomplishments:** A draft assessment report of findings and recommendations is due August 15, 2008, and the final report is due by August 29, 2008. Investigations continue to determine if existing multi-spectral imagery can be used to generate maps of teasel infestations. A color map showing good detail of teasel infestations along a two-mile length of I-70 has been created.

---

RI07-021/TR080721

**FY 2008 MoDOT Customer Satisfaction Tracking - Motor Carriers****Principal Investigator:** Heartland Market Research LLC**Total Contract Amount:** \$46,000**Contract Begin Date:** 7/12/2007**Contract End Date:** 6/6/2008

**Project Purpose:** This study assesses MoDOT's Motor Carrier Services customer satisfaction through a written survey.

**Task Milestones and Accomplishments:** The March 2008 results that concluded this contract was received and approved in April 8, 2008 and the results will be reported in the July 2008 Tracker. *This contract is complete as of 4th quarter FY 2008.*

---

RI07-022/TR080722

**MoDOT FY 2008 MoDOT Customer Satisfaction Tracking - Motorist Assist****Principal Investigator:** Heartland Market Research LLC**Total Contract Amount:** \$35,000**Contract Begin Date:** 7/12/2007**Contract End Date:** 6/6/2008

**Project Purpose:** This study assesses MoDOT's Motorist Assist customer satisfaction through a written survey.

**Task Milestones and Accomplishments:** The March 2008 report was received and approved on April 10, 2008 and the results will be reported in the July 2008 Tracker. *This contract is complete as of 4th quarter FY 2008.*



**Contract Research Status (cont'd.)**

RI07-023/TR080723

**FY 2008 MoDOT Customer Satisfaction Tracking - Involved Public**

**Principal Investigator:** Heartland Market Research LLC

**Total Contract Amount:** \$30,000

**Contract Begin Date:** 7/12/2007

**Contract End Date:** 6/6/2008

**Project Purpose:** This study assesses MoDOT's customer satisfaction of citizens who attend public meetings through a written survey.

**Task Milestones and Accomplishments:** The June 2008 report was received and approved on June 4, 2008 and the results will be reported in the July 2008 Tracker. *This contract is complete as of 4th quarter FY 2008.*

---

RI07-024/TR080724

**FY 2008 MoDOT Customer Satisfaction Tracking-Planning Partners**

**Principal Investigator:** Heartland Market Research LLC

**Total Contract Amount:** \$14,000

**Contract Begin Date:** 7/12/2007

**Contract End Date:** 6/6/2008

**Project Purpose:** This study assesses MoDOT's statewide customer satisfaction through a web-based survey

**Task Milestones and Accomplishments:** The May 2008 results were received and approved on May 5, 2008 and the results will be reported in the July 2008 Tracker. *This contract is complete as of 4th quarter FY 2008.*

**Contract Research Status (cont'd.)**

RI07-026/TR080726

**MoDOT Library Systems: Operations and Information Services****Principal Investigator:** University of Missouri - Columbia**Total Contract Amount:** \$156,749**Contract Begin Date:** 7/1/2007**Contract End Date:** 6/30/2009 (awarded on a two-year basis)

**Project Purpose:** Provide library, research and reference support services to MoDOT. This project is established for a two-year period funded one year at a time. UMC will provide the services of a MLS librarian who shall work 40 hours per week and will be located at the Secretary of State's State Library.

**Task Milestones and Accomplishments:** The MoDOT Transportation Library continues to support researchers by providing literature searches and other reference services, as well as manage a growing collection of transportation documents. In March of 2008, the project was awarded MoDOT's first Innovative Researcher of the Year Award for services in rapidly locating and providing needed information for decision making, resulting in substantial cost savings to the department.

RI07-029A/TR080729

**Decision Support System for Optimal Depot and Fleet Management****Principal Investigator:** University of Missouri - Columbia**Total Contract Amount:** \$48,500**Contract Begin Date:** 5/30/2007**Contract End Date:** 4/26/2008

**Project Purpose:** The objective of this project is to develop an optimization-based decision support system to address depot and fleet management issues associated with typical DOT maintenance system operations. This analysis will be conducted with respect to minimizing both the capital and operating costs, while ensuring that desired service levels are maintained or improved.

**Task Milestones and Accomplishments:** Modeling has been developed and is still being validated. The validation will be accomplished by working with MoDOT maintenance forces from District 5. A meeting is proposed to discuss this validation.

**Contract Research Status (cont'd.)**

RI 07-035/TR080735

**Impacts of Public Policy on Rail Development in Missouri**

**Principal Investigator:** Cambridge Systematic  
**Total Contract Amount:** \$59,717  
**Contract Begin Date:** 5/1/2008  
**Contract End Date:** 6/30/2009

**Project Purpose:** The ultimate objective of this research is to provide the Missouri Department of Transportation (MoDOT) with the rail industry perspective on legal, political, economic and regulatory issues that have significant impact on their operations and market decisions. Missouri strives to be well informed on rail issues with regards to freight and passenger service and how shaping public policy can overcome barriers the industry may face.

**Task Milestones and Accomplishments:** A project kickoff meeting was conducted on May 1, 2008. The Cambridge PI has been in contact with Class One operators in Missouri and MoDOT staff has also forwarded 210, 700, 931 and 941 schedules to the investigators.

---

RI07-036/TR080736

**Techniques, Equipment and Strategies to Maximize Navigation on the Missouri River in Low-Flow Situations**

**Principal Investigator:** TransSystems  
**Total Contract Amount:** \$79,796  
**Contract Begin Date:** 9/13/2007  
**Contract End Date:** 6/30/2008

**Project Purpose:** Identify and review low flow industry trends, equipment, and strategies used in inland navigation settings throughout the United States and worldwide that may be transferable to the Missouri River.

**Task Milestones and Accomplishments:** The final report is due August 18, 2008. Report was reviewed and MoDOT is working with Transystems on final edits to the final report.

**Contract Research Status (cont'd.)**

RI07-041/TR080741

**Verification of GIS-Based Archaeology Site Locations****Principal Investigator:** OSA**Total Contract Amount:** \$74,913**Contract Begin Date:** 1/1/2008**Contract End Date:** 12/31/2008

**Project Purpose:** MoDOT has determined that a Geographic Information System (GIS) geo database of Missouri archaeological sites and surveys, maintained by the state's Department of Natural Resources (DNR) requires thorough examination by professional archeologists. An updated, verified geo database will be submitted as a deliverable to MoDOT to facilitate the agency's project scoping and development activities.

**Task Milestones and Accomplishments:** OSA is making reasonable progress a. OSA should be able to complete the effort within the overall timeline. OSA has shown good communication throughout the project and is working well with the Missouri SHPO.

---

RI07-042/TR080742

**Quick Test for Durability Factor****Principal Investigator:** Missouri University of Science and Technology**Total Contract Amount:** \$59,997**Contract Begin Date:** 12/15/2007**Contract End Date:** 11/15/2008

**Project Purpose:** To establish a relationship between the concrete Durability Factor and various quickly determined aggregate characteristics. Missouri has gone to performance-based specifications. The test currently used to determine the durability of a concrete takes weeks to months to run. The goal of this project is to find a correlation between quick in-field tests that will reliably indicate the durability of concrete. This would identify problems before concrete has been poured eliminating the need for the contractor to either tear out what they have already done or for MoDOT to accept a substandard product with a financial penalty on the contractor.

**Task Milestones and Accomplishments:** Most of the aggregate samples have been provided to the PI. They have begun testing.



**Contract Research Status (cont'd.)**

RI07-043/TR0807043

Alternate Fuel (E-85) Performance/Economics/Quality Usage

**Principal Investigator:** TranSystems

**Total Contract Amount:** \$19,957

**Contract Begin Date:** 12/31/2007

**Contract End Date:** 7/31/2008

**Project Description:** While ethanol as a vehicle fuel has many benefits; it also appears to have shortcomings in availability, costs, performance, and user perceptions. This study will look at actual usage data to quantify MoDOT's experience with ethanol. Flex Fuel Vehicles are federally required and their fuel usage is significant to MoDOT. There may also be significant considerations in terms of air quality, support of national import goals, and Missouri's economy.

**Task Milestones and Accomplishments:** TranSystems compiled the results of literature search and data analysis into a draft report. MoDOT reviewed the report and then requested improvements. A final report should be completed and published by the end of August 2008.

---

RI07-044/TR080744

Impacts of Public Policy on Safety - Graduated Drivers License (GDL)

**Principal Investigator:** University of Missouri – Kansas City

**Total Contract Amount:** \$43,611

**Contract Begin Date:** 11/30/2007

**Contract End Date:** 12/1/2008

**Project Description:** Current drivers' license policies gradually give new drivers more privileges. These Graduated Drivers Licenses (GDL) policies have been shown to improve safety. However, there are many different policies between Missouri and other states as well as proposals for further policy changes. GDL policies and effects are significant to highway safety, law enforcement. Effects of current and potential future policies need to be examined so any changes can be made based on sound data.

**Task Milestones and Accomplishments:** Investigators have provided updates on time as they continue to analyze the available data. A draft of the final report is due in September and should be published in October 2008.

**Contract Research Status (cont'd.)**

RI07-047/TR0807047 and RI07-07A/TR08047A

**The New I-64 Economic and Regional Mobility Study**

**Principal Investigator:** HDR, Inc./Department of Economic Development

**Total Contract Amount:** \$897,421/\$9,155

**Contract Begin Date:** 12/5/2007

**Contract End Date:** 12/31/2011

**Project Purpose:** The objective of this research study is to provide a before, during and after analysis of the economic dimensions, community issues and regional mobility issues with the construction of the New I-64 Project in St Louis City and County.

**Task Milestones and Accomplishments:** Full closure of I-64 occurred on January 2, 2008. Baseline traffic data has been collected and analyzed. MoDOT's contracted research firm, HDR, has released its second quarterly report on the impact of the first five months of the Interstate 64 closure. The second quarterly report evaluates the areas of communications, mobility and economics during January through May 2008.

The report includes the results of more than 2,950 people who have been surveyed by mail, on-line, and in person through Motorist Assist and at major retail locations. Satisfaction was highest with "how well the public has been kept informed" (91 to 95 percent) and "the timeliness of information" (89 to 94 percent). The least amount of satisfaction was expressed for "how traffic is flowing in work zones" (69 to 76 percent) and "accuracy and understandability of construction zone signs" (76 to 77 percent).

RI07-050/TR080750

**Impacts of Public Policy on Air Service Development in Missouri**

**Principal Investigator:** Wilbur Smith Associates

**Total Contract Amount:** \$95,769

**Contract Begin Date:** 4/1/2008

**Contract End Date:** 6/30/2009

**Project Purpose:** The ultimate objective of this research is to provide MoDOT with the aviation industry perspective on legal, political, economic and regulatory issues that drive their current market decisions and future valuations. This analysis will assist MoDOT in their commitment to providing Missouri with a business and transportation regulatory climate that is favorable to air related development.

**Task Milestones and Accomplishments:** A kick off meeting was conducted with MoDOT staff, air carrier airport staff and Wilbur Smith. Wilbur Smith also sent a survey to the carriers and is in the process of synthesizing those responses.

**Contract Research Status (cont'd.)**

RI07-052/TR080752

**Quick Test for Percent of Deleterious Materials**

**Principal Investigator:** Missouri University of Science and Technology

**Total Contract Amount:** \$44,813

**Contract Begin Date:** 12/1/2007

**Contract End Date:** 11/30/2008

**Project Purpose:** To develop a system of standard tests which would augment or replace the deleterious test. The system could be comprised of several tests, or a single test. Missouri's test for deleterious material is subjective which leads to operator bias and difficulties with repeatable results. The goal of this research project is to determine a test or tests, which are an objective measure of the percent of deleterious material.

**Task Milestones and Accomplishments:** Most of the aggregate samples have been provided to the PI during this period and will be tested in the first quarter of FY 2009.

---

RI07-053/TR080753

**Early Permeability Tests for Asphalt Acceptance**

**Principal Investigator:** Center for Transportation Research Excellence

**Total Contract Amount:** \$74,998

**Contract Begin Date:** 12/1/2007

**Contract End Date:** 10/31/2008

**Project Purpose:** MoDOT is moving toward end-result specifications in which the contractor has more responsibility in mix designs, but the materials must pass certain tests. This project will develop a determination of asphalt permeability utilizing a quicker, nondestructive test method for accepting asphalt pavement. The test method should alert the construction inspector when asphalt pavement might have performance issues long before the current acceptable method.

**Task Milestones and Accomplishments:** Samples will be taken from construction projects laying asphalt pavement and tested and compared to laboratory samples.

**Contract Research Status (cont'd.)**

RI07-056/TR080756

**Seismic Health monitoring of Springfield Lake Bridges: In-house (Contracted for equipment)****Principal Investigator:** Jennifer Harper**Completed Date:** 3/25/2008

**Project Purpose:** Rehabilitation work was planned for the interchange at Routes 65/60/62 as well as rehab of bridge L0514. When taking borings near the bridges it was discovered that there were voids in the rock structure supporting the bridge piers. Bridge L0514 is bearing directly on this rock foundation. Instead of a partial replacement of L0514, it will now be fully replaced but until that time it was determined that MoDOT should monitor the bridge for any movement.

**Task Milestones and Accomplishments for Period:** A seismic monitoring company was able to provide sensors, which will convert accelerations to a movement detection system. The system will send out an alarm to the District Bridge Engineer if there is movement detected over a certain acceptable range that would be induced by traffic. The system has been deployed and is fully operational in District 8.

---

RI07-062/TR080762

**Evaluation of Work Zone Enhancement Software Programs****Principal Investigator:** University of Missouri - Columbia**Total Contract Amount:** \$50,086**Contract Begin Date:** 2/1/2008**Contract End Date:** 1/31/2009

**Project Purpose:** The purpose is to identify appropriate analytical tools to guide design of different types of work zones. The tools (software) can assist in developing effective plans to manage and communicate work zone activities. These tools quantify the travel delay and user costs and hence can be used to plan, design and schedule the work activity to minimize the users costs. MoDOT is particularly interested in QuickZone, QUEWZ, CA4PRS, and Spreadsheet models.

**Task Milestones and Accomplishments:** The CA4PRS software from California arrived in March. Other states have been contacted for their work zone analysis tools. Analysis of the CA4PRS software is underway with a test network and assigned hypothetical traffic volumes, a list of parameters that need to be calibrated for the programs is being populated. Upon review of the QUEWZ tool, the version that's currently being sold by McTrans is really dated (1982) and MoDOT staff noted that it might not be worthwhile to investigate the tool.



**Contract Research Status (cont'd.)**

RI08-002/TR080802

**IBRD Sonar Scour Monitoring Project Contract**

**Principal Investigator:** Paul Rydlund

**Total Contract Amount:** \$78,600

**Contract Begin Date:** 4/1/2008

**Contract End Date:** 6/30/2009

**Project Purpose:** MoDOT is using 2006 IBRD funds to find a dependable and accurate way to measure scour on bridge piers. The IBRD award was to develop two different methodologies. The first method is using a sonar device. We have a contract with USGS to deploy sonar technology on two Missouri bridges. One monitor will be placed at the Jefferson Barracks Bridge on the Mississippi river and one on a Chariton river bridge. The second technology is being developed in another MoDOT project utilizing changes in temperature between a scour hole and compacted material. (See Remote Health Monitoring project.)

**Task Milestones and Accomplishments for Period:** This project has been extended due to the many flood events this summer. The Mississippi river has been above floods stage since March of 2008 and remains so. The river levels must drop before the instrumentation can be installed. The sonar system has been partially deployed on the Chariton River; unfortunately another flood even has prevented further work.

---

RI08-003/TR080803

**Customer Perception of MoDOT's Maintenance Performance Measures**

**Principal Investigator:** Jennifer Harper

**Total Contract Amount:** Developing

**Contract Begin Date:**

**Contract End Date:**

**Project Purpose:** The ultimate objective of this research is to provide the Maintenance Division with the information necessary to determine which items measured in their annual performance review are of the most importance to the customer. Notably, the measures should not only report the road condition but also ensure MoDOT is concentrating resources on areas of importance to the customer. Secondly, this information will be used to update the ranking (a.k.a. weights) used for statistical analysis and to make any data gathering adjustments that might be necessary.

**Task Milestones and Accomplishments for Period:** This project is in the process of being revamped. A meeting is scheduled for October to revisit the goals and approach to be used.

**Contract Research Status (cont'd.)**

RI08-013/TR080813

**FY 2009 MoDOT Customer Satisfaction Tracking - Motor Carriers****Principal Investigator:** Heartland Market Research LLC**Total Contract Amount:** \$61,333**Contract Begin Date:** 5/15/2008**Contract End Date:** 5/15/2009

**Project Purpose:** This study assesses MoDOT's Motor Carrier Services' customer satisfaction through a written survey. The survey is conducted quarterly using a list of customers served each quarter and the results are reported in MoDOT's Tracker.

**Task Milestones and Accomplishments:** The report for the July 2008 Tracker (due July 7, 2008) will include results from January, February and March 2008 customers. The report for the October 2008 Tracker (due October 6, 2008) will include results from April, May and June 2008 customers. The report for the January 2009 Tracker (due January 5, 2009) will include results from July, August and September 2008 customers.

RI08-014/TR080814

**FY 2009 MoDOT Customer Satisfaction Tracking - Motorist Assist****Principal Investigator:** Heartland Market Research LLC**Total Contract Amount:** \$46,667**Contract Begin Date:** 5/15/2008**Contract End Date:** 5/15/2009

**Project Purpose:** This study assesses MoDOT's Motorist Assist customer satisfaction through a written survey. Operators hand a postage paid mail-in survey to customers served throughout the year. Surveys are mailed to the primary investigator whom collects the information, analyzes it and provides a quarterly report. The results are presented in the MoDOT Tracker each quarter.

**Task Milestones and Accomplishments:** The report for the July 2008 Tracker is due July 7, 2008 and will include surveys received from April to June 2008. The report for the October 2008 Tracker is due October 6, 2008 and will include surveys received from July to September 2008. The report for the January 2009 Tracker is due January 5, 2009 and will include surveys received from October to December 2008. The final report for this contract will supply data for the April 2009 Tracker (due April 6, 2009) and will include surveys received from January to March 2009.

**Contract Research Status (cont'd.)**

RI08-015/TR080815

**FY 2009 MoDOT Customer Satisfaction Tracking - Involved Public**

**Principal Investigator:** Heartland Market Research LLC

**Total Contract Amount:** \$15,000

**Contract Begin Date:** 5/15/2008

**Contract End Date:** 5/15/2009

**Project Purpose:** This study assesses MoDOT's customer satisfaction of citizens who attend public meetings through a written semi-annual survey.

**Task Milestones and Accomplishments:** The next semi-annual report will analyze the surveys mailed after May 1, 2008 and received by the end of November 2008. The report will be emailed to MoDOT by December 8, 2008.

---

RI08-016/TR080816

**FY 2009 MoDOT Customer Satisfaction Tracking-Planning Partners**

**Principal Investigator:** Heartland Market Research LLC

**Total Contract Amount:** \$11,500

**Contract Begin Date:** 5/15/2008

**Contract End Date:** 5/15/2009

**Project Purpose:** This study assesses MoDOT's statewide customer satisfaction of planning partners through an annual web-based survey. The contractor supplies a report that breaks out the data by District as well as providing a statewide summary.

**Task Milestones and Accomplishments:** The report for this contract will be sent to MoDOT by April 15, 2009.

---

RI08-017/TR080817

**FY 2009 MoDOT Customer Satisfaction Tracking-Right Transportation Solutions**

**Principal Investigator:** Heartland Market Research LLC

**Total Contract Amount:** \$36,000

**Contract Begin Date:** 05/15/2008

**Contract End Date:** 05/15/2009

**Project Purpose:** This study assesses MoDOT's customer satisfaction with recent road projects through an annual written survey. The contractor supplies a report that breaks out the data by project, by District, as well as providing a statewide summary.

**Task Milestones and Accomplishments:** The report for this contract will be sent to MoDOT by December 15, 2008.

.....

**Contract Research Status (cont'd.)**

RI08-021/TR080821

**Resilient Moduli of Type 5 Granular Base Materials****Principal Investigator:** Missouri University of Science and Technology**Total Contract Amount:** \$7,434**Contract Begin Date:** 6/15/2008**Contract End Date:** 7/15/2008

**Project Purpose:** The purpose of this project is to accurately determine the resilient moduli for two unbound granular base sources at optimum moisture content in accordance with the AASHTO T 307 test method. Both sources will be tested with 3 replicate samples.

**Task Milestones and Accomplishments:** Contract agreement was executed and testing of samples began.

---

RI08-023/TR080823

**Midwest Rail Initiative (Membership)****Total Contract Amount:** \$33,000**Contract Begin Date:** 6/15/2008**Contract End Date:** 6/30/2011

**Project Purpose:** This membership is for the Midwest Regional Rail Initiative (MWRRI) of which Missouri has been a member for over 10 years. This is an important membership because not only is passenger rail traffic increasing, (even as of April on our own line) but the state-supported corridor has been designated a high-speed rail corridor.

**Task Milestones and Accomplishments:** There are eight active Midwest states in the MWRRI. States pay their fee each year for about \$11,000 or the whole total at once for \$33,000. *The three-year fee was paid in the 4th quarter of FY 2008.*



## In-House Research Status

RI04-030/TR080430

### Cathodic Protection of Bridge A12112

**Start Date:** 7/31/2005

**Completion Date:** 10/31/2009

**Project Purpose:** This sacrificial CP system was provided at no cost by Corrpro Co. and was installed (connected to the reinforcing steel) on the shoulder of Bridge A12112, I-44 WB, Crawford County under a low slump concrete deck overlay in 2005. A galvanic or passive system, if it provides good protection, would lower costs and eliminate the need for electrical power, which is hard to supply to the bridge site especially in rural areas.

**Task Milestones and Accomplishments:** The third annual inspection, including taking electrical readings, will be done next quarter.

---

RI06-004/TR080604

### Quiet Pavement

**Start Date:** 2/4/2006

**Completion Date:** 6/30/2010

**Project Purpose:** Assess the sound reduction qualities of a Special Quiet Asphalt pavement applied on Rt. 340, St. Louis County. Contractor and MoDOT agreed to change this overlay from a regular super pave mix to an open-graded rubber asphalt mix similar to Arizona DOT quiet pavement. This quiet asphalt mix was used in the residential area path of this 5-lane road to reduce the tire noise and hopefully the noise level at the roadside homes. District 6 has requested OR to review for an additional 2 years. Initial readings were contracted and the follow up tests have been an in house effort.

**Task Milestones and Accomplishments:** Pavement noise testing, texture and ambient sound level testing will be done as well as traffic counts before and after new pavement was placed in 2006. A construction report done in 2006 and follow up report done in 2007. It was requested by the District Engineer that additional follow-up sound level testing be done for another two years. The biannual sound level testing was done in April 2008 and a summary report was provided to the St Louis district.

**In-House Research Status (cont'd.)**

RI07-016/TR080716

**District 9 Critical Area Roadside Vegetation Establishment****Start Date:** 5/17/2007**Completion Date:** 5/31/2010

**Project Purpose:** Lack of permanent vegetation on Missouri State Hwy 60, in southern Missouri, has left large areas of the right-of-way unprotected from soil erosion. Erosion occurring on large areas of slope range from slight to severe and the silt from this erosion is leaving deposition in the drainage systems and moving off site to areas that are within the national scenic river watershed. This study is testing methods to establish permanent vegetation in these areas, and control the erosion. The study began in spring of 2007 on several different sites. MoDOT and NRCS jointly monitor these sites. This study is an in-house study that is no longer requiring funds; the personnel in the area are monitoring this study as part of their District's budget.

**Task Milestones and Accomplishments:** During the most recent evaluation it was observed that the switch grass is well established using erosion blankets. The team documented an erosion percentage for each site and found that with the fiber mulch erosion rates were higher with reduced grass establishment. *OR's participation with this project is complete.*

---

RI07-039/TR080739

**Converting Pavement Smoothness, PI to IRI****Start Date:** 6/29/2007**Completion Date:** 12/31/2008

**Project Purpose:** To develop a transitional specification to move smoothness specifications from using a California profilograph which measures in 25 ft. increments to inertial profiler machines, which use International Roughness Index or IRI. Better road quality data can be derived from IRI and it is also the measure that is collected by Transportation Planning's ARAN van for system condition inspections.

**Task Milestones and Accomplishments:** A literature search of pavement smoothness specifications was done in the second quarter of 2008. These specification will be analyzed by OR and planning divisions to make a recommendation on a new pavement smoothness specification using IRI in Missouri Standard Specifications and Engineering Policy Guide.

**In-House Research Status (cont'd.)**

RI07-045/TR080745

**Automated Vehicle Status and Location Study (AVSAL)**

**Start Date:** 3/10/2007

**Completion Date:** 7/1/2008

**Project Description:** GPS, cell phone, and computer technology combined can provide real time location and status information of vehicles in a fleet. Potential benefits are more efficient vehicle usage, better maintenance, fuel savings, and better emergency response. Headquarters and the St Louis District 6 had both tried limited use of "GPS" units and found them worthwhile enough to try more complete studies. Each of them selected a different system. This study is comparing the systems as well as looking at the overall costs and advantages.

**Task Milestones and Accomplishments:** As this type of project by others have found, most of the benefits of the system have proven to be case by case illustrations rather than measurable quantities. Installation of the units was completed. Users are still adapting and learning to use the systems.

---

RI07-054/TR080754

**Development of Specifications for Using Self-Consolidating Concrete in P/S Girder Members**

**Start Date:** 6/1/2007

**Completion Date:** 9/30/2008

**Project Purpose:** The purpose of the project is to develop a specification for the use of the girders. MoDOT has begun using new girders developed in Nebraska. The shape of the new girders is making it difficult for the pre-casters to properly consolidate the concrete without heavy labor costs. MoDOT has been approached to allow SCC on pre-cast girders.

**Task Milestones and Accomplishments:** The draft specifications were shared with industry and their comments were incorporated into the specifications. The specification approval has been on hold until an NCHRP research project is finished regarding SCC in bridge girders.

---

RI07-057/TR080757

**Two-Lane Rural Road Edge Striping**

**Start Date:** 10/10/2007

**Completion Date:** 5/31/2008

**Project Purpose:** Determine the effect of the 2003 striping guidelines in regard to edge-line and centerline treatment on two-lane rural roads. Has the number of accidents attributed to lack of edge-line and centerline marking been reduced?

**Task Milestones and Accomplishments:** On March 27, 2008 a final report and summary documents was submitted to MoDOT staff and a meeting was held on April 28 to discuss changes to the final report including the addition of day/night severity effects.

.....

**In-House Research Status (cont'd.)**

RI07-059/TR080759

**Review of Pipe Culvert Specifications****Start Date:** 10/15/2007**Completion Date:** 11/30/2008

**Project Purpose:** Verify the condition and effectiveness of 2004 Standard Specification changes putting culvert pipe into Group A, B and C and show any design or construction improvement or time or cost savings benefits from using the new groupings.

**Task Milestones and Accomplishments:** Made list of all HDPE pipe used by contractors for Group B specified pipe since 2004 until the present. Next quarter's activities will include continuation of the condition analysis of all pipe inspected with field inspections of a representative sample in other studies and additional Group B pipe inspections. Recommendations will be formulated on best practices to be used in Missouri for pipe culvert design and installation.

---

RI07-060/TR080760

**Epoxy Stripe Removal****Start Date:** 11/20/2007**Completion Date:** 5/15/2008

**Project Purpose:** Determine the best practice to re-stripe concrete pavement with Epoxy paint.

**Task Milestones and Accomplishments:** MoDOT staff has reviewed the summary and conclusions and this study can be considered complete since no more data will be collected. The study is considered inconclusive. *This project is complete as of 4th quarter FY 2008.*

---

RI07-061/TR080761

**Re-Stripe Center-Line Rumble Stripe****Start Date:** 11/1/2007**Completion Date:** 6/30/2008

**Project Purpose:** Determine the best surface preparation methodology that MoDOT's maintenance forces can use to replace the striping over both centerline and edge line strips.

**Task Milestones and Accomplishments:** After two field trip visits, observations have been made based on the appearance and retro reflectivity readings of the rumble strips. There is still more data that needs to be collected to complete the data collection phase. The plan is to collect one more set of data prior to Winter 2008. Based on the observations and data collected, a report has been started. A survey was also made to AASHTO RAC members and their answers were studied. No further data has been collected during the final quarter of FY 2008 and *this project is considered complete as of 4th quarter FY 2008.*



### **In-House Research Status (cont'd.)**

RI08-001/TR080801

#### **Dicke Safety Speed Feedback Display (SFD) Sign**

**Start Date:** 2/4/2008

**Completion Date:** 11/30/2008

**Project Purpose:** This study has the following objectives: 1) determine the effectiveness of the Work Zone Speed Limit and evaluate its location within the Construction Signing set up, and 2) determine the driver's reaction when he/she is aware of his/her speed.

**Task Milestones and Accomplishments:** In April, MoDOT staff updated the minimum product specification list and five companies submitted their bids to MoDOT. Speed Check was selected and General Services will start the paperwork to acquire the equipment. The study has been divided into four sections and the I-70 corridor engineers have agreed to help with the study. The speed signs have been received by MoDOT to date and are waiting installation.

---

RI08-039/TR080839

#### **Median Guard Cable Evaluation Phase Two (follow up to RI 06-014)**

**Start Date:** 5/1/2008

**Completion Date:** 7/31/2009

**Project Purpose:** Further study the effectiveness of Median Guard Cable.

**Task Milestones and Accomplishments:** During this quarter, a field survey was created and districts two and five agreed to participate. The forms were mailed to four districts in total and the arrival of the forms was confirmed. Considering the typical I-70 median cross sections the critical slope (closest to the shoulder) will be used to correlate the Median Guard Cable effectiveness with the slope. Only if the secondary slope has a longer run than the critical slope, the secondary should be used.

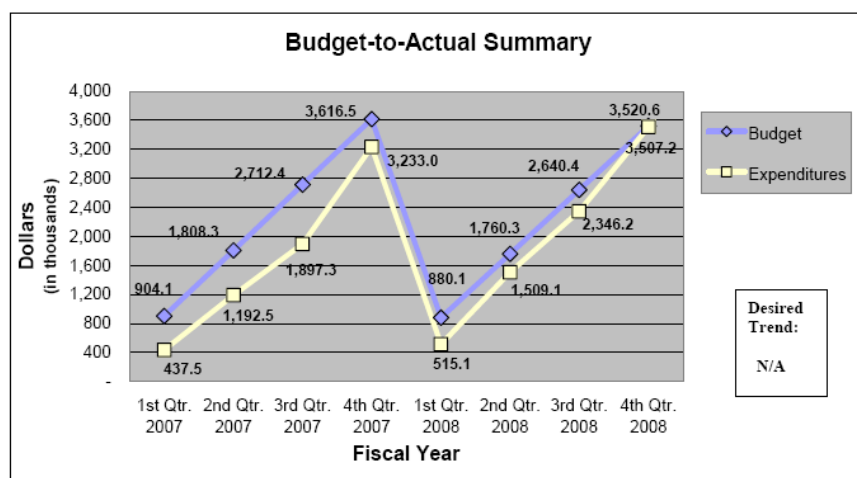


## Budget and Performance Data

*Organizational Results always strives to deliver:*

- ♦ *The best value for every dollar spent,*
- ♦ *Innovative transportation solutions, and*
- ♦ *Fast projects that are of great value.*

## Budget-to-Actual Summary



Organizational Results' approved budget total for FY 2008 is \$3,520,586, which is slightly less than the FY 2007 budget of \$3,616,538. Of the total FY 2008 budget amount, \$1,362,678 was budgeted for personal services and fringe benefits, and \$2,157,908 was budgeted for equipment and expenses. Total expenditures for FY 2008

are \$3,507,172 or 99.62 percent of budget. Compared to FY 2007 of \$3,233,014 or 89.40 percent of budget. Total equipment and expenses expenditures are significantly closer to budgeted amounts. This is a marked improvement over last year's totals.

## SPR FY 2008 Budget Summary

|                     | <u>Budget Amount</u> | <u>Expenditures</u> | <u>Percent Expended</u> |
|---------------------|----------------------|---------------------|-------------------------|
| Administration      | 484,000              | \$424,805           | 87.8%                   |
| Research            | 2,107,915            | 1,847,368           | 87.6%                   |
| Development         | 150,000              | 89,628              | 59.8%                   |
| Technology Transfer | <u>220,000</u>       | <u>90,456</u>       | <u>41.1%</u>            |
| Part II Total       | \$2,961,915          | \$2,452,257         | 85.8%                   |
| Part 1 Total        | <u>\$570,863</u>     | <u>\$872,237</u>    | 152.8%                  |
| Grand Total         | <b>\$3,532,778</b>   | <b>\$3,325,494</b>  | <b>94.1%</b>            |

During FY 2008, Organizational Results Division realized a 5.9 percent budget surplus or \$207,284. This can be attributed to increased attention to project payouts and project monitoring.

## Number and Percent of Research Recommendations Implemented

During fiscal year 2008, MoDOT's research program completed 28 total research projects. Sixteen projects were categorized as information and policy guidance reports and are considered implemented. Twelve projects were categorized as technical, product-focused projects. Of the twelve technical reports, eight projects produced implemented results within the department. This represents a 67 percent implementation rate for the technical report recommendations. MoDOT's implementation rate for technical projects is slightly ahead of the New York implementation rate of 64 percent. MoDOT's Organizational Results continues to aggressively pursue research and innovations focused on addressing pertinent department needs that are closely tied to the 18 Tangible Results. This focus will lead to more usable solutions and better

value. While not all research results or solutions can be implemented, MoDOT recognizes the importance and value of conducting a research program driven to make a difference.

Organizational Results worked with the Performance Advisory Teams (PAT), Division and

District Leaders, Senior

Management and

outside researchers to

identify research and

performance needs for

the department. The

research projects were

then prioritized and

compared to budget

constraints to outline

the research program

for the Department that

will be administered

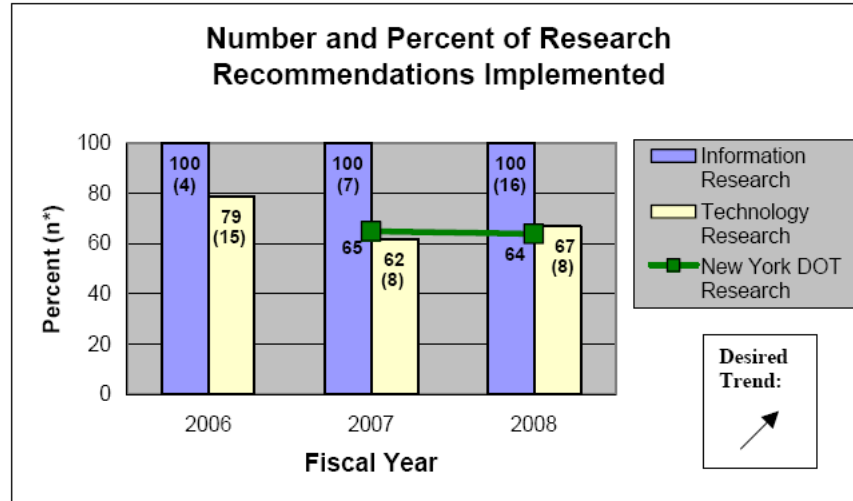
through Organizational

Results. The research

program has outlined

both the contract and in-house research projects for fiscal year 2009. The 2009 research program

was approved on June 30, 2008.



\*(n) Indicates the number of research recommendations implemented

## Percent of Best Practices by Implementation Status

During fiscal year 2008,

MoDOT's Solutions at

Work has verified and

shared 19 best practices

with department

employees. Six of those

best practices have been

shared within the past

thirty days resulting in

insufficient time to

implement and are not

part of this survey

cycle. Overall, 83

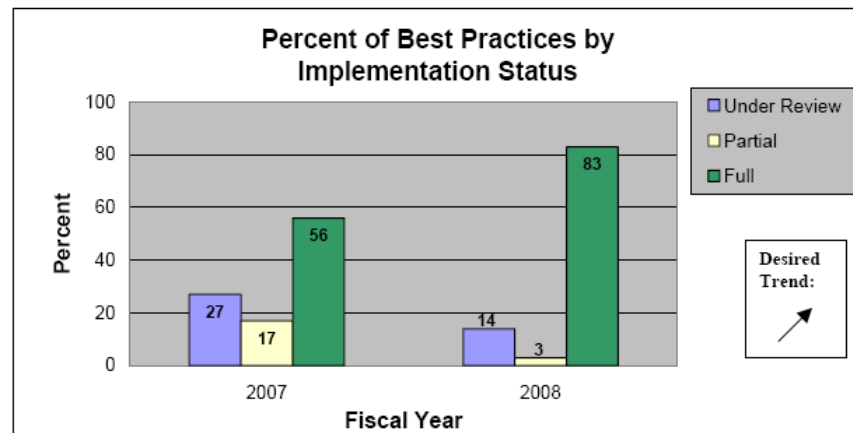
percent of the best practices have been fully implemented with 3 percent partially implemented

and 14 percent still under review. With 86 percent of best practices partially or fully

implemented, MoDOT is aggressively taking advantage of best practices. The 14 percent still

under review is partially due to the need to customize some best practices to better fit operational

or regional needs. The improved implementation rate during the fiscal year is attributable to

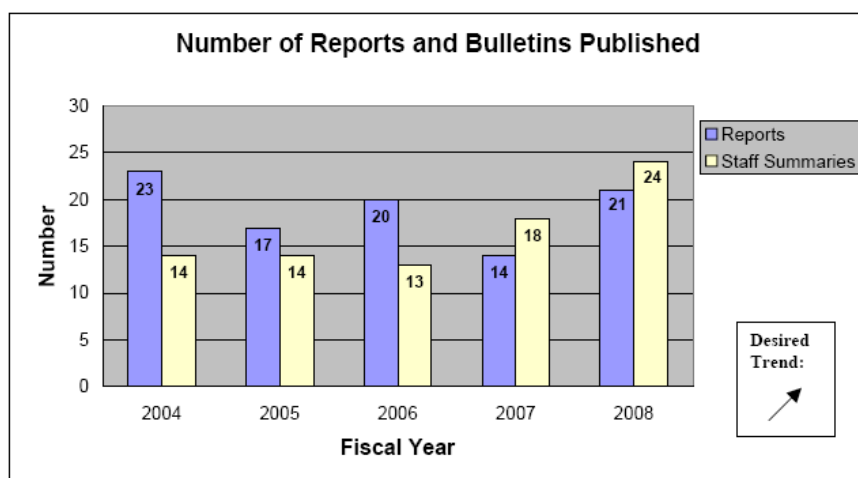




stricter evaluation criteria and improved statewide communication of best practices through monthly videoconferences. Implementation of these best practices resulted in a net savings of nearly \$1.5 million. Most notably the department saved more than \$1 million through a process to recover costs associated with removal of underground petroleum storage tanks.

### Number of Reports and Summaries Published

The total number of published reports during fiscal year 2008 rebounded to 21, which is just two less than the all-time high set in FY 2004. The number of staff summaries continued to grow to a

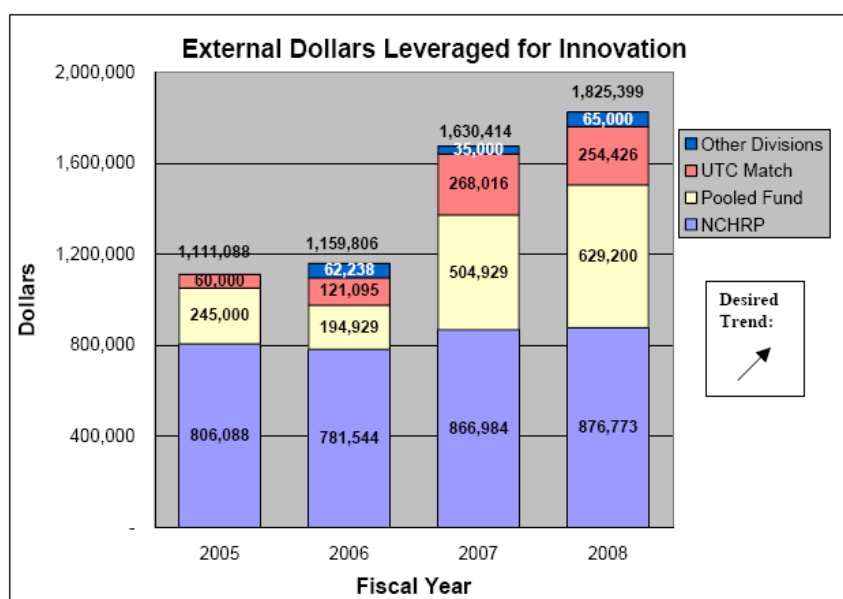


record number of 24 for FY 2008. The increases in reports and staff summaries for the year is due in part to a renewed focus on developing a final communication piece for all internal and external research projects. Beginning in October 2008, a new OR Tracker measure will track cycle time for report and summary publication.

### External dollars leveraged for innovation

University Transportation Center funding is the only data currently available for this measure, and is obtained from the Missouri University of Science and Technology, formerly University of Missouri – Rolla (UMR).

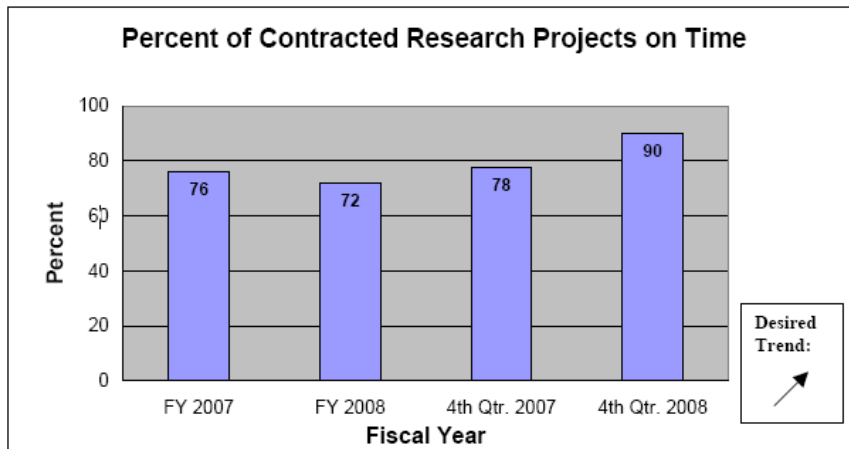
UTC funding amounts represent the total awarded or committed amount during each fiscal year. Awarded UTC funding amounts decreased from \$268,016 in FY 2007 to \$254,426 in FY 2008. Increased partnerships within the University of Missouri System should provide more opportunity to utilize available UTC funds in the future.



## Number of Contract Research Projects Completed



## Percent of Contract Research Projects On Time





Missouri Department  
of Transportation

2217 St. Marys Blvd.  
Jefferson City, MO 65109  
573.526.4335